Meaning and Satisfaction in Structural Engineering

By Jim Lintz, P.E., S.E., LEED AP BD+C

To keep our profession attractive to the next generation… we should let others know why our jobs are worthwhile.

There seems to be a lot of angst among structural engineers about our profession, a general notion that we do not get the credit that we deserve or the proper amount of respect from the public. It is as if we work in the Rodney Dangerfield of professions, "*I don't get no respect.*" However, having recently read Samuel C. Florman's book, *The Existential Pleasures of Engineering*, first published in 1976, it is clear that our concerns for our profession are not new. Many of the concerns Florman had 44 years ago continue to this day, such as not attracting enough of the best and brightest students, engineering education being too technical, lack of passion for our work, lack of exposure for engineers in popular culture such as novels or movies, and not getting the same respect as other professions. Since then, other concerns have developed, such as not retaining talent, not adopting new technology quickly enough, and being replaced by technology.

While all of these concerns may be valid, our profession has remained an indelible and essential part of society. To keep our profession attractive to the next generation and respected by society, we should let others know why our jobs are worthwhile. Instead of consistently highlighting our concerns, we should be letting college students, young engineers, and our communities know how our careers bring satisfaction and meaning to our lives.

Ask a group of structural engineers what they like about their jobs, and the first item on most lists will be the joy it brings to see their work transformed into real-world structures. Creating something tangible from an idea is fundamental to being human. Enhancing this is the knowledge that our work improves society. Exactly how lives will be improved is clear when designing a new children's hospital, but what about designing a new warehouse? Rest assured, no one would invest the enormous amount of capital it takes to construct the projects we design without a solid belief that their investment will pay off. Via free markets, the only way for this to occur is for each party to improve the other's life through a product, service, or payment. Otherwise, no deal would be made. Fortunately, en route to the final transaction, many other lives will be made better as well. That warehouse will provide temporary jobs to construction workers and new, longer-lasting jobs for warehouse workers. It will provide storage for products and may be the reason that your new online purchase can be delivered the next day and at no cost, instead of next week. All of which improves the quality of life.

The modern world has been, to no small degree, designed by engineers. As structural engineers, we play an essential role. Consider the simple warehouse again. A structural engineer was involved in designing the bones of the building. A mechanical engineer then designed the HVAC system, an electrical engineer the lighting, a plumbing engineer the piping, a fire protection engineer the sprinklers, a civil engineer the grading, and a geotechnical engineer the site itself. If we broaden our perspective, we realize other engineers designed the light bulbs, the mechanical equipment, the dock levelers, and so on. And more engineers designed the forklifts, racking systems, and computers for the building. We can further consider the electrical grid, the water and wastewater systems, and the roads and bridges leading to the warehouse, all designed by engineers. Considering for just a moment all of the engineering that went into making one simple warehouse functional, we should be proud to be a part of that process, humbled that it takes so many, and grateful to live at a time and place where this is possible.

As structural engineers, we are engaged in creative work nearly every day. Society typically assigns the term creative to sculptors, painters, musicians, and authors, but not engineers. This is a mistake. Our job is to turn ideas into real-life structures. That is pure creativity. The constraints upon our work do not stifle creativity; they focus it. Developing novel, elegant solutions to complex problems is at the heart of our profession. Whether by new computer code to streamline calculations or by sketchpad to design a complicated connection, solving challenging problems brings deep satisfaction. This comes from understanding the solution in our mind and seeing the final built structure standing strong against a storm.

To be a successful engineer, one needs to understand mathematics and science at a level that is well beyond the norm of society. While this may set us apart, it is not something that we should shrink from. With this understanding comes both enjoyment and responsibility. Having a better understanding of the physical world allows us to appreciate and enjoy the wonders of both the built and natural environment. Driving down the road and understanding the forces in the cables of a bridge or the elasticity of a branch swaying in the breeze enhances our experience of the world in a way unbeknownst to those around us.

There may be times when we feel that society is not giving us the credit we are due. If that is getting you down, try creating a photo gallery on your phone of projects you have designed. Something you could show an acquaintance who wonders what exactly you do. Or stream some old *Mythbusters* episodes to enjoy the fun of engineering again. Or maybe grab some drinks after work with your co-workers and share old stories. You will be glad you did.

Modern society would not exist without the work of scientists and engineers whose understanding of the laws of nature allows us to build great cities, travel quickly between them, and communicate across vast distances without going anywhere. Fulfilling our responsibility to carry on this incredible human project brings meaning to our work and our lives. What more can someone ask of their career than for it to instill meaning in their own lives and for it to improve the lives of those around them?▪

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